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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

CAO, DIEM K

ART UNIT	PAPER NUMBER
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2126

DATE MAILED: 03/10/2004

15

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/468,614

Applicant(s)

SINHA ET AL.

Examiner

Diem K Cao

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 13-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 13-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action is in response to the request for consideration filed on 1/13/2004.
2. Claims 1-10 and 13-28 remain in the application.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 13 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 13 and 14 are depended on the cancelled claim 11. Examiner interprets claims 13 and 14 both depend on claim 10 for examining purpose. Correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-7, 9-10, 13-17, and 19-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hinckley (U.S. 5,828,882) in view of Corrington et al. (U.S. 6,076,142) further in view of Devireddy et al. (US 2002/0133669 A1).

7. **As to claim 1**, Hinckley teaches (col. 4, lines 39-56) registering (registration request 102) the management application (program 104) with an event application programming interface (event notification facility 100 includes a program interface 102), detecting occurrence of an event (event detection hardware and/or software), notifying the management application of the event via the event application programming interface (event manager perform ... of the program). Hinckley also suggests the system can be utilized with a variety of operating systems, events and programs (col. 6, lines 29-41).

8. However, Hinckley does not teach an operating system module to interface with a RAID device controller that comprises an I/O processor, detecting occurrence of an event of the I/O processor with a RAID monitor service operating above the operating system module.

Corrington teaches an operating system module to interface with a RAID device controller (the RAID system 10 ... a RAID controller; col. 5, lines 35-59 and the RAID system is coupled to the host computer system 12; col. 4, lines 61-65), and detecting (monitor) occurrence of an event from a RAID controller (status and failures of the components) with the RAID monitor service (ICU Module and Monitor Utility; col. 11, line 41 – col. 12, line 13 and Fig. 2, col. 5, lines 9-34). However, Corrington teaches the RAID monitor service is located in the RAID system. Devireddy teaches the RAID monitor service could be located either in the RAID system or in

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the computer (RAID controllers labeled ... host-based RAID control; page 2, section 0017), and teaches the RAID monitor service is located in the computer wherein the management functions performs monitoring the health of the storage subsystem and alert notifications for any storage related events and enclosure management (page 2, section 0018 – page 3, end of section 0019). “Official Notice” is taken that a RAID device controller comprising I/O processor is well known and implemented in the art.

9. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Corrington, Hinckley and Devireddy because it would provide the user the options to check and correct the RAID system events (col. 2, lines 38-63).

10. **As to claim 2**, Hinckley as modified teaches (col. 4, lines 39-56) updating the event application programming interface (When an event 110 occurs, ... to an event manager 118) with the RAID monitor service upon occurrence of the event (event interface 116 connected to event detection hardware and/of software).

11. **As to claim 3**, Hinckley does not explicitly teach registering includes identifying a storage medium associated with the event. Hinckley teaches event type is registered with the event notification facility (col. 4, lines 39-56). It would have been obvious to modify the system of Hinckley to identify the storage medium associated with the event when the system is utilized to monitor the RAID device because it provides the method to fix the failed storage medium.

12. **As to claim 4**, Hinckley teaches registering the management application includes identifying the type of event (Each entry of an event table ... type of event 110; col. 4, lines 39-56).

13. **As to claim 5**, Hinckley teaches registering the management application includes providing the event application programming interface with a callback function (handler routine; col. 4, line 39 – col. 5, line 17).

14. **As to claim 6**, Hinckley teaches (col. 4, lines 39-56) the event application programming interface (event manager 118) use the callback function to (handler routine 108) notify the management application (program 104) of the occurrence of the event (event 110 occurs).

15. **As to claim 7**, Hinckley teaches creating an interprocess communication between the RAID monitor service and the management application (event detected by the monitor service is notified to the management application; col. 4, lines 39-67).

16. **As to claim 9**, Hinckley teaches (col. 4, lines 39-56) the event application programming interface (event notification facility 100, event manager 118) returns (performs a procedure call) a callback function (handler routine 108) upon notification of the event (when an event 110 occurs).

17. **As to claim 10**, Hinckley teaches (col. 4, lines 39-56) registering (registration request 102) the application (program 104) with a programming interface (event notification facility 100 includes a program interface 102), detecting occurrence of a hardware event (event, variety type of events) with a monitor service (event detection hardware/software) that operates above the operating system module and that is separate from the programming interface (the event notification facility operates above the operating system), notifying the management application of the event via the event application programming interface (event manager perform ... of the program). Hinckley also suggests the system can be utilized with a variety of operating systems, events and programs (col. 6, lines 29-41).

18. Hinckley teaches registering application including registering the event type (col. 4, lines 39-67). However, Hinckley does not teach an operating system module to interface with a device, and registering the application includes storing data identifying an input/output processor that monitors the device. Corrington teaches an operating system module to interface with a device (the RAID system 10 ... a RAID controller; col. 5, lines 35-59 and the RAID system is coupled to the host computer system 12; col. 4, lines 61-65), and detecting (monitor) occurrence of an event from a RAID controller (status and failures of the components). However, Corrington teaches the RAID monitor service is located in the RAID system. Devireddy teaches the RAID monitor service could be located either in the RAID system or in the computer (RAID controllers labeled ... host-based RAID control; page 2, section 0017), and teaches the RAID monitor service is located in the computer wherein the management functions performs monitoring the health of the storage subsystem and alert notifications for any storage related events and

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enclosure management (page 2, section 0018 – page 3, end of section 0019). “Official Notice” is taken that a RAID device controller comprising I/O processor is well known and implemented in the art.

19. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Corrington, Hinckley and Deviredy because it would provide the user the options to check and correct the RAID system events (col. 2, lines 38-63).

20. **As to claim 13**, Hinckley as modified teaches storing data identifying the hardware event (Each entry of the event table 200 corresponds to a type of event 110; col. 4, lines 60-65).

21. **As to claim 14**, Hinckley as modified does not explicitly teach storing a hardware identification value that identifies a storage medium associated with the event. Hinckley as modified teaches storing data identifying the hardware event (Each entry of the event table 200 corresponds to a type of event 110; col. 4, lines 60-65). It would have been obvious to one of ordinary skill in the art at the time the invention was made that the system of Hinckley would have to store the hardware identification value that identifies a storage medium because it provides the application with needed information related to the event in order to process that event (col. 9, lines 39-50).

22. **As to claim 15**, Hinckley teaches notifying the programming interface of the occurrence of the event with a monitor (event manager perform ... of the program; col. 4, lines 39-56).

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However, Hinckley does not teach detecting occurrence of an event from a RAID with the RAID monitor service. Corrington teaches (col. 11, lines 41 – col. 12, lines 13) detecting (monitor) occurrence of a hardware event from a RAID (status and failures of the driver) with the RAID monitor service (ICU Module and Monitor Utility). It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the teaching of Corrington to the system of Hinckley because it would provide the user a method to check and correct the RAID system events (col. 2, lines 38-63).

23. **As to claim 16**, Hinckley teaches notifying the application includes providing a callback function (handler routine; col. 4, lines 51-56).

24. **As to claim 17**, see rejection of claim 1 above.

25. **As to claim 19**, Hinckley as modified by Corrington teaches notify the management application of a hardware event (When an event occurs ... the program; col. 4, lines 39-56).

26. **As to claim 20**, Hinckley does not explicitly teach the hardware event is selected from the group consisting of a disk drive failure, disk drive initialization, array migration, and data recovery. Corrington teaches (col. 5, line 9 – col. 6, line 65) the hardware event is selected from a group consisting of a disk drive failure (drive module failure occurs), disk drive initialization (create RAID set), array migration (designate spare drives), and data recovery (rebuild failed drive). It would have been obvious to one of ordinary skill in the art at the time the invention was

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made to apply the teaching of Corrington to the system of Hinckley so it can monitor and process the status of the RAID system (col. 5, lines 60-67).

27. **As to claim 21**, refer to claim 12 above for rejection.

28. **As to claim 22**, it is rejected under the same ground of claim 10.

29. **As to claim 23**, Hinckley teaches there are multiple management applications (col. 3, lines 19-35), and also suggests the system can be utilized with a variety of operating systems, events and programs (col. 6, lines 29-41). However, Hinckley does not teach the management application is selected from the group consisting of a desktop management program, a RAID system management application, and a RAID monitor application. Corrington teaches a RAID monitor application. It is obvious there are many programs to monitor the RAID system and any one of them could work with the system of Hinckley.

30. **As to claim 24**, Hinckley does not teach a RAID device and a RAID monitor device. Corrington teaches (col. 11, lines 41 – col. 12, lines 13) a RAID device (RAID) and a RAID monitor device (ICU Module and Monitor Utility). It would have been obvious to apply the teaching of Corrington to the system of Hinckley because it provides a method to utilize the system of Hinckley to monitor the RAID system.

31. **As to claim 25**, Hinckley does not teach an intelligent input/output controller to interface with the RAID device, and the intelligent input/output controller comprises the I/O processor.

Corrington teaches an intelligent input/output controller to interface with the RAID device (The RAID system ... a RAID controller, removable and hot swappable drive modules 14; col. 5, lines 9-59 and Fig. 2). "Official Notice" is taken that a RAID device controller comprising I/O processor is well known and implemented in the art. It would have been obvious to apply the teaching of Corrington to the system of Hinckley because the advantage of I/O controller is well known and implemented in the system of RAID.

32. **As to claim 26**, it is rejected under the same ground of claim 1.

33. **As to claim 27**, Hinckley teaches (col. 4, lines 39-56) registering (registration request 102) the management application (program 104) with an event application programming interface (event notification facility 100 includes a program interface 102).

34. **As to claim 28**, Hinckley teaches (col. 4, line 39 – col. 5, line 40) instructions that cause the processor to provide the function of the event programming interface (The event notification ... connected to event detection hardware and/or software).

35. Claims 8 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hinckley (U.S. 5,828,882) in view of Corrington et al. (U.S. 6,076,142) and Devireddy et al. (US 2002/0133669 A1) further in view of Skarbo et al. (U.S. 5,805,886).

36. As to claims 8 and 18, Hinckley does not explicitly teach unregistering the management application with the event application programming interface. Skarbo teaches (col. 7, lines 40-45) unregistering (unregister) the management application (communication application) with the event application programming interface (address book). It would have been obvious to one of the ordinary skill in the art to apply the teaching of Skarbo to the system of Hinckley because it would provide the management application a way to unregister itself when it doesn't interesting in event notification.

Response to Arguments

37. Applicant's arguments with respect to claims 1, 10, 17, 22, and 26 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Diem K Cao whose telephone number is (703) 305-5220. The examiner can normally be reached on Monday - Thursday, 9:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (703) 305-9678. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any response to this action should be mailed to:

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